Sub B1

41. A method according to claim 40, further comprising:

sequentially transmitting each of the generated plurality of processed signals to achieve the desired radiation level at a number of locations in the desired sector during at least one of said sequential transmissions.

42. A method according to claim 40, wherein the desirable radiation level is a non-null level.

A4 Sub B2

43. A method according to claim 40, wherein the desired sector is comprised of a range of azimuths up to the complete range of azimuths of the antenna array.

44. A method according to claim 40, wherein developing a signal processing procedure comprises:

selecting a weight vector from a sequence of different weight vectors, wherein elements of the weight vectors selectively modify one or more characteristics of transmission of the signal from each antenna in the antenna array.

45. A method according to claim 44, wherein the transmission characteristics include one or more of signal amplitude and/or phase.

46. A method according to claim 45, wherein the sequence of weight vectors share an amplitude value and have random phase values.

47. A method according to claim 45, wherein the sequence of weight vectors is comprised of weight vectors that are orthogonal.

48. A method according to claim 47, wherein the orthogonal weight vectors have elements with the same magnitude.

A4

49. A method according to claim 47, wherein the orthogonal weight vectors are developed from one or more of rows or columns of a complex valued Walsh-Hadamard matrix, rows or columns of a real valued Hadamard matrix, and/or a sequence whose elements are basis vectors of a Fourier transform.

Sub B3

50. A method according to claim 45, wherein the sequence of weight vectors is comprised of weight vectors designed to provide a desirable radiation pattern within at least a sub-sector of an overall desired sector.

51. A method according to claim 50, wherein the desirable radiation pattern is a near omni-directional radiation pattern.

Sub B4

52. A method according to claim 50, wherein the overall desired sector is the whole range in azimuth.

Sub B4

53. A method according to claim 45, wherein the sequence of weight vectors includes weight vectors that are representative of weight vectors designed for transmission to known subscriber unit(s).

54. A method according to claim 53, wherein the weight vectors designed for transmission to known subscriber unit(s) are determined from spatial signature(s) associated with each of the subscriber unit(s).

A4

55. A method according to claim 45, wherein the weight vectors are determined from weight vectors designed for transmission to known subscriber unit(s) using a vector quantization clustering process.

56. A method according to claim 55, the vector quantization clustering process comprising:

assigning an initial set of weight vectors as a current set of representative weight vectors;

combining each designed for subscriber unit weight vector with its nearest representative weight vector in the current set, according to some association criterion;

determining an average measure of a distance between each representative weight vector in the current set and all weight vectors combined with that representative weight vector;

replacing each representative weight vector in the current set with a core weight vector for all the weight vectors that have been combined with that representative weight vector; and

iterative repeating the combining, determining and replacing steps until a magnitude of the difference between the average measure in a present iteration and the average distance in the previous iteration is less than a threshold.

57. A method according to claim 40, wherein the plurality of signal processing procedures is commensurate with the plurality of antennae within the antenna array used to sequentially transmit the signal.

58. A storage medium comprising content which, when executed by an accessing machine, implements a method according to claim 40.

A4

59. A wireless communication system element comprising:

a storage medium including content; and

a processor element, coupled with the storage medium, to execute at least a subset of the content to implement a method according to claim 40.

Sub B4

60. A subscriber unit comprising:

two or more antenna configured as an antenna array; and

processing element(s), coupled with the antenna array, to develop a plurality of signal processing procedures, and to iteratively process a signal through each of the plurality of developed signal processing procedures to generate a plurality of processed signals which, when sequentially transmitted via the antenna array, generate a desired radiation level at a number of locations within a desired sector.

61. A subscriber unit according to claim 60, wherein the processing element(s) are comprised of one or more of an application specific integrated circuit (ASIC), a digital signal processor

(DSP), a field-programmable logic array (FPGA) and/or a microcontroller resident within the subscriber unit.

Sub B7

62. A subscriber unit according to claim 60, further comprising:

a transceiver, coupled with the antenna array and the processor element(s), to sequentially transmit each of the generated plurality of processed signals to achieve the desired radiation level at a number of locations in the desired sector during at least one of said sequential transmissions.

63. A subscriber unit according to claim 62, wherein the processor element(s) are integrated within the transceiver.

A4

64. A subscriber unit according to claim 63, wherein the transceiver comprises at least one processor element for each antenna within the antenna array.

65. A subscriber unit according to claim 60, wherein the processor element(s) select a radiation level that is a non-null level.

66. A subscriber unit according to claim 60, wherein the desired sector is comprised of a range of azimuths up to a complete range of azimuths of the antenna array.

67. A subscriber unit according to claim 66, wherein the processor element(s) select a weight vector from a sequence of different weight vectors to develop the processing procedure, wherein

elements of the weight vectors selectively modify one or more characteristics of transmission of the signal from each antenna in the antenna array.

68. A subscriber unit according to claim 67, wherein the transmission characteristics include one or more of a signal amplitude and/or phase.

69. A subscriber unit according to claim 67, wherein the sequence of weight vectors share an amplitude value and have random phase values.

A4

70. A subscriber unit according to claim 67, wherein the sequence of weight vectors are comprised of weight vectors which are orthogonal to one another.

71. A subscriber unit according to claim 70, wherein the orthogonal weight vectors share a common magnitude.

72. A subscriber unit according to claim 70, wherein the processor element(s) develop the orthogonal weight vectors from one or more of rows or columns of a complex valued Walsh-Hadamard matrix, rows or columns of a real valued Hadamard matrix, and/or a sequence whose elements are basis vectors of a Fourier transform.

73. A subscriber unit according to claim 67, wherein the sequence of weight vectors is comprised of weight vectors designed to provide a desirable radiation pattern within at least a sub-sector of an overall desired sector.

74. A subscriber unit according to claim 73, wherein the processor element(s) develop the sequence of weight vectors designed to provide a desirable radiation pattern based, at least in part, on information associated with known communication station(s) in the desired sector.

75. A subscriber unit according to claim 74, wherein the processor elements develop the sequence of weight vectors from spatial signature(s) associated with the known communication station(s).

76. A subscriber unit according to claim 74, wherein the processor element(s) develop the sequence of weight vectors using a vector quantization clustering process.

77. A subscriber unit according to claim 70, wherein the processor element(s) develop a plurality of signal processing procedures commensurate with the plurality of antennae comprising the antenna array.

Sub B8

78. A communication station comprising:

two or more antenna configured as an antenna array; and

processing element(s), coupled with the antenna array, to develop a plurality of signal processing procedures, and to iteratively process a signal through each of the plurality of developed signal processing procedures to generate a plurality of processed signals which, when sequentially transmitted via the antenna array, generate a desired radiation level at a number of locations within a desired sector.

79. A communication station according to claim 78, wherein the processing element(s) are comprised of one or more of an application specific integrated circuit (ASIC), a digital signal processor (DSP), a field-programmable logic array (FPGA) and/or a microcontroller resident within the communication station.

Sub B9

80. A communication station according to claim 78, further comprising:

one or more transceivers, coupled with the antenna array and the processor element(s), to sequentially transmit each of the generated plurality of processed signals to achieve the desired radiation level at a number of locations in the desired sector during at least one of said sequential transmissions.

A4

81. A communication station according to claim 80, wherein the processor element(s) are integrated within one or more of the transceiver(s).

82. A communication station according to claim 80, wherein the transceiver comprises at least one processor element for each antenna within the antenna array.

83. A communication station according to claim 78, wherein the desired sector is comprised of a range of azimuths up to a complete range of azimuths of the antenna array.

84. A communication station according to claim 78, wherein the processor element(s) select a weight vector from a sequence of different weight vectors to develop the processing procedure,

wherein elements of the weight vectors selectively modify one or more characteristics of transmission of the signal from each antenna in the antenna array.

85. A communication station according to claim 84, wherein the transmission characteristics include one or more of a signal amplitude and/or phase.

86. A communication station according to claim 84, wherein the sequence of weight vectors share an amplitude value and have random phase values.

A4

87. A communication station according to claim 84, wherein the sequence of weight vectors are comprised of weight vectors which are orthogonal to one another.

88. A communication station according to claim 87, wherein the processor element(s) develop the orthogonal weight vectors from one or more of rows or columns of a complex valued Walsh-Hadamard matrix, rows or columns of a real valued Hadamard matrix, and/or a sequence whose elements are basis vectors of a Fourier transform.

89. A communication station according to claim 84, wherein the sequence of weight vectors is comprised of weight vectors designed to provide a desirable radiation pattern within at least a sub-sector of an overall desired sector.

90. A communication station according to claim 89, wherein the processor element(s) develop the sequence of weight vectors designed to provide a desirable radiation pattern based, at least in part, on information associated with known subscriber unit(s) in the desired sector.

91. A communication station according to claim 90, wherein the processor elements develop the sequence of weight vectors from spatial signature(s) associated with the known subscriber unit(s).

92. A communication station according to claim 90, wherein the processor element(s) develop the sequence of weight vectors using a vector quantization clustering process.

A4

93. A communication station according to claim 92, wherein performing the vector quantization cluster process, the processor element(s):

assign an initial set of weight vectors as a current set of representative weight vectors;

combine each designed for subscriber unit weight vector with its nearest representative weight vector in the current set, according to some association criterion;

determine an average measure of a distance between each representative weight vector in the current set and all weight vectors combined with that representative weight vector;

replace each representative weight vector in the current set with a core weight vector for all the weight vectors that have been combined with that representative weight vector; and

iteratively repeat the combining, determining and replacing elements until a magnitude of the difference between the average measure in a present iteration and the average distance in the previous iteration is less than a threshold.